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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,224	04/01/2002	Mathew Sommers	GLO 2 0096	9509

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FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP
1100 SUPERIOR AVENUE, SEVENTH FLOOR
CLEVELAND, OH 44114

EXAMINER

SAWHNEY, HARGOBIND S

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 01/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/063,224

Applicant(s)

SOMMERS ET AL.

Examiner

Hargobind S Sawhney

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 13, 15-17 and 19-25 is/are rejected.
- 7) ☒ Claim(s) 11, 14 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features reflecting the limitations recited in claims 19-22 must be shown or the feature(s) canceled from the claim(s).

A unitary threadedly connectable LED-based light source comprising:

- a threaded connector, power converting electronics, a plurality of LEDs, a light dispersing element arranged at a focal region, and an optical system including a reflector and a lens.

No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

Paragraph 0013 does not specify in a definite manner that the LED-based light source for this embodiment is a unitary threadedly connectable LED-based light source having physically integrated light dispersing element, a reflector and a lens, power converting electronics and a plurality of LEDs. As specified in Paragraph 0036, the above-indicated details of the LED-based light source needs to be specified in Paragraph 0013.

Paragraph 0013, lines 6-10, " the light dispersing element is arranged at the focal region" does not clearly specify whether the "focal region" is of the reflector, lens or any optical element.

Appropriate correction is required.

The instant application has been examined considering a unitary threadedly connectable LED-based light source having physically integrated light dispersing element, a reflector and a lens, power converting electronics and a plurality of LEDs. In addition, claim 19 is further examined on the basis of considering the "focal region" as the region of the focus of the reflector of the LED light source as that of the similar arrangement specified in Paragraph 0033, lines 8-10.

Claim Objections

3. Claim 23-25 are objected to because of the following informalities:

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Claim 23, line 5, "a number of LEDs" should be rephrased as -- a plurality of LEDs--; and

Claim 25, lines 1 and 2, "the connector, the LEDs and the redirecting element comprising a single mechanically rigid apparatus" should be rephrased as -- the connector, the LEDs and the redirecting element physically integrated into a single mechanically rigid apparatus.

Appropriate correction is required.

Claims 24 and 25 are necessarily objected because of their dependency on the objected base Claim 23.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are as follows:

Claim 19, line 8, "a light dispersing element arranged at a focal region" does not clearly specify whether the "focal region" is of the reflector, lens or any optical element.

Similar deficiencies exist in rest of Claim 19 and its dependent claims.

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Claims 20-22 are necessarily rejected because of their dependency on the rejected base Claim 19.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art admitted by the applicant – hereafter referred as the prior art in this office action- in view of Zhang (US Patent Application Pub. No.: US 2002/0021573 A1).

Regarding claims 1-5, the prior art discloses a traffic signal ball 10 (Figure 1, Para. 0002) comprising:

- an incandescent lamp 12 (Figure 1, Para. 0002) including a threaded electrical connector 16 (Figure 1, Para. 0002); and
- an optical system including a parabolic reflector 22 and a lens 24 (Figure 1, Para. 0002) receiving light from the incandescent lamp 12, and forming at least a portion of the received light into outwardly directed light beam (Figure 1, Para. 0002);

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- the lens 24 of optical system further having a lens being tinted, and spectrally filtering the light beam (Figure 1, Para. 0003).

However, the prior art does not teach the following limitations recited in Claim 1.

A lamp including a plurality of Light Emitting Diodes (LEDs), a threaded electrical connector and an optical element dispersing forwardly directed light produced by the LED lamp.

On the other hand, Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) discloses a lighting device comprising an LED lamp (Figures 3.1 and 4.1) including:

- a plurality of LEDs 1 and a threaded electrical connector 5 (Figures 3.1 and 4.1, Para. 0092); and
- an optical element 2 (Figures 3.1 and 4.1, Para. 0092) dispersing – optical element with diffused surface (Paragraph 0091, lines 9 and 10) - forwardly directed light produced by the LEDs 1 (Figures 3.1 and 4.1, Para. 0092).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the traffic signal ball of the prior art by replacing the incandescent lamp with the LED lamp as taught by Zhang for benefit and advantage of providing a device having high energy efficiency, long operating life and low maintenance cost.

Regarding claims 6-9, the prior art in view of Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) obviously meets the method limitations of claims 6-8 with the teaching of:

- a lamp including a plurality of Light Emitting Diodes (LEDs) 1 (Zhang, Figures 3.1 and 4.1, Para. 0092);

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- a threaded electrical connector 5 (Zhang, Figures 3.1 and 4.1, Para. 0092); a threaded socket 16 (the prior art admitted by the applicant, Figure 1, Para. 0002);
- power feeding cables 20 (the prior art, Figure 1, Para. 0002); an optical element 2 (Zhang, Figures 3.1 and 4.1, Para. 0092) directing forwardly directed light produced by the LED lamp;
- a heat sink 3 (Zhang, Figures 3.1 and 4.1, Para. 0092) removing the heat from the LED lamp 1;
- an electrical conditioning circuit 4 (Zhang, Figures 3.1 and 4.1, Para. 0094 and Para. 0093 and 0103) receiving power from the threaded electrical connector, and conditioning it to the electrical power for the LED lamp;
- the LEDs 1 powered through the threaded socket, and producing white light – blue LEDs covered with a layer of fluorescent material - (Zhang, Figures 3.1 and 4.1, Para. 0095); and
- the LEDs 1 powered through the threaded socket, and producing red light (Zhang, Figures 3.1 and 4.1, Para. 0095).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to the method limitations by applying combined teaching of the prior art and Zhang.

8. Claims 10,12,13,15-17 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art admitted by the applicant in view of Terlep (US Patent No.: 5,594,433) and Zhang (US Patent Application Pub. No.: US 2002/0021573 A1).

Regarding claim 10, the prior art (instant application, paragraphs 0002-0004) discloses a traffic signal lamp 10 (Figure 1, Para. 0002) comprising an incandescent light bulb 12 (Figure 1, Para. 0002) electrically powered through a threaded type socket connector 18 (Figure 1, Para. 0002).

However, the prior art does not teach an LED-based light source including;

- at least one LED and a screw-based electrical connector compatible for a threaded socket;
- the screw-based electrical connector transmitting electrical power to the at least one LED;
- a reflector cooperating with the at least one LED, and reflecting the LED light to an optic of the traffic signal lamp.

On the other hand, Terlep (US Patent No.: 5,594,433) discloses an omni directional LED lamp 100 (Figure 2B) comprising:

- at least one LED 110 (Figure 2B, column 3, line 42) and a bayonet base electrical connector 102 (Figure 2B, column 3, line 63);
- a reflector 115 (Figure 2B, column 3, line 67) cooperating with the at least one LED 110, and reflecting the LED light to an optic 24 (the prior art, Figure 1, Para. 0002) of the traffic signal lamp 10 disclosed in the prior art admitted by the applicant.

However, Terlep (US Patent No.: 5,594,433) teaches the at least one LED source including a bayonet base instead of a screw-based electrical connector compatible for a threaded socket which is well known in the art.

On the other hand, Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) discloses a lighting device comprising an LED lamp (Figures 3.1 and 4.1) including a threaded electrical connector 5 (Figures 3.1 and 4.1, Para. 0092) connector compatible for a threaded socket.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the traffic signal ball of the prior art admitted by the applicant by:

- replacing the incandescent lamp with the LED lamp as taught Terlep ('433) by for benefit and advantage of proving a device having high energy efficiency, long operating life and low maintenance cost; and
- further modifying the LED lamp of Terlap with the screw-type base for the benefit and advantage of improving the applicability of the light source for retrofitting traffic signal lights.

Regarding claims 12,13 and 15-17, the prior art admitted by the applicant in view of Terlep (US Patent No.: 5,594,433) and Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) further discloses:

- the reflector 115 (Figure 2B, column 3, line 67) additionally including:
 - a light transmissive encapsulant 117 (Terlep, Figure 2, column 3, line 67 and column 4, lines 1 and 2) surrounding the at least one LED 110, and having a surface defining the reflector shape 115 (Terlep, Figure 2B);
 - the surface of the reflector shape 115 further including reflective material of metallic coating (Terlep, Figure 2B, column 4, lines 1-4);

- a depression – cavity element of the reflector 115 – arranged above the at least one LED 110 (Terlep, Figure 2B);
- the at least one LED 110 emitting white light, light produced by blue LEDs covered with a layer of fluorescent material (Zhang, Figures 3.1 and 4.1, Para. 0095), converted into a selected light color while cooperating with the tinted optical element 24 (prior art admitted in the instant application, Figure 1, Para. 0003); and
- the at least one LED 110 producing red light (Zhang, Figures 3.1 and 4.1, Para. 0095).

Regarding claims 23-25, the prior art admitted by the applicant (instant application, paragraphs 0002-0004) discloses light-producing apparatus 10 (Figure 1, Para. 0002) comprising:

- a socket 18 (Figure 1, Para. 0002) holding and powering a lamp 12 (Figure 1, Para. 0002);
- an optical system including a reflector 22 and a lens 24 (Figure 1, Para. 0002).
- the reflector 22 and lens 24 cooperatively directing light outwardly from the light-producing apparatus.

However, the prior art admitted by the applicant does not teach lamp including;

- a plurality of LEDs electronically connected to a connector installing the lamp in a socket of a light producing apparatus;

- a redirection element redirecting light emitted by the LEDs, and optically coupling the redirected into an optical system of the light producing apparatus light ;
- the plurality of LEDs and a screw-based electrical connector compatible for a threaded socket; and
- the connector, the LEDs and the redirecting element comprising a single mechanically rigid apparatus.

On the other hand, Terlep (US Patent No.: 5,594,433) discloses omni directional LED lamp 100 (Figure 2B) comprising:

- a plurality of LEDs 110,120 (Figure 2B, column 3, line 42) and a bayonet base electrical connector 102 (Figure 2B, column 3, line 63); and
- a redirection element 115,125 (Figure 2B, column 3, line 67) redirecting light from the plurality of the plurality LEDs 110,120, and coupling into the optical system^{22,24} (the prior art admitted by the applicant, Figure 1, Para. 0002) of the light producing apparatus.

However, Terlep (US Patent No.: 5,594,433) does not teach the electrical connector being a threaded connector compatible for a threaded socket, which is well known in the art.

On the other hand, Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) discloses a lighting device comprising an LED lamp (Figures 3.1 and 4.1) including a threaded electrical connector 5 (Figures 3.1 and 4.1, Para. 0092) connector compatible for a threaded socket.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the traffic signal ball of the prior art admitted by the applicant by:

- replacing the incandescent lamp with the LED lamp as taught Terlep ('433) by for benefit and advantage of proving a device having high energy efficiency, long operating life and low maintenance cost; and
- further modifying the LED lamp of Terlap with the screw-type base as taught by Zhang for the benefit and advantage of making the light source widely applicable for retrofitting traffic signal lights.

Regarding Claim 25, the prior art admitted by the applicant in view of Terlep (US Patent No.: 5,594,433) and Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) discloses the connector 5 (Zhang, Figures 3.1 and 4.1, Para. 0092), the LEDs 110,120 (Terlep, Figure 2B, column 3, line 42) and the redirecting elements 115,125 (Terlep, Figure 2B, column 3, line 67).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to assemble the traffic signal ball of the prior art admitted by the applicant with additional modifications as taught by Zhang and Terlep.

Allowable Subject Matter

9. Claims 11,14 and 18 are objected to as being dependent upon a rejected base

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claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record, including Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) and Terlep (US Patent No.: 5,594,433), does not show or suggest the applicant's invention as claimed. Specifically, the prior art of record does not disclose proper motivation for combining an illuminated display comprising:

- a heat sink controlling heat generated by an LED based light source as recited in claim 11;
- the reflector having a reflecting material including a partially light-transmissive material allowing partial light transmission as recited in Claim 14;
- the LED light source functionally cooperating with a masking filter defining a selected output shape as recited in Claim 18.

10. Claim 19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

The prior art of record, including Zhang (US Patent Application Pub. No.: US 2002/0021573 A1) and Terlep (US Patent No.: 5,594,433), does not show or suggest the applicant's invention as claimed. Specifically, the prior art of record does not disclose proper motivation for combining an illuminated display comprising:

- a unitary threadedly connectable LED-based light source having physically integrated light dispersing element, an optical system including a reflector and a lens, power converting electronics and a plurality of LEDs as recited in Claim 19.

Claims 20-22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lye et al. (U.S. Patent No. 6,292,901 B1), Zhang et al. (U.S. Patent No. 6,227,679 B1) and Lee (Korean Patent No. KR 2001000635), Conway et al. (U.S. Patent No. 6,149,283) Kuo et al. (U.S. Patent No. 6,019,493), Kanbar (U.S. Patent No. 5,850,126), Uchida (U.S. Patent No. 4,727,289) each discloses a LED lamp comprising some of the claimed features claimed by the applicant.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hargobind S Sawhney whose telephone number is 703-306-5909. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M.

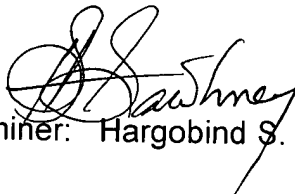
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2956.

HSS
January 16, 2003


Examiner: Hargobind S. Sawhney